

WHAT IS CLAIMED IS:

1. A method for folding an integrated circuit substrate to change relatively large substrate into an integrated circuit having a much smaller form-factor than the original unfolded circuit, comprising:

producing a least one circuit element in a first active region of a substrate;

producing a least one circuit element in a second active region of said substrate, said first active region and said second active region being on a top side of said substrate, said top side separated from an underside of said substrate by a substrate thickness;

producing a least one conducting trace to connect said at least one circuit element in said first active region to said at least one circuit element in said second active region, said conducting trace lying on said top side;

thinning at least a portion of said substrate by removing material from said underside underneath said conducting trace to produce a reduced-thickness region; and

folding said substrate at said reduced-thickness region.

2. The method of Claim 1, wherein said substrate comprises silicon.

3. The method of Claim 1, wherein said at least one circuit element in said first active region is a transistor.

4. The method of Claim 1, wherein said at least one circuit element in said first active region is a resistor.

5. The method of Claim 1, wherein said reduced-thickness region is less than 20 microns thick.

6. The method of Claim 1, further comprising inserting an inter-fold plate in between two folds of said substrate.

7. The method of Claim 6, further comprising inserting at least one insulating layer between said inter-fold plate and said substrate.

8. The method of Claim 6, further comprising inserting at least one insulating bonding between said inter-fold plate and said substrate.

9. The method of Claim 6, wherein said inter-fold plate comprises a thermally-conductive material.

10. The method of Claim 6, wherein said inter-fold plate comprises a metallic plate.

11. The method of Claim 1, wherein said substrate is folded such that said first active region and said second active region remain exposed when said substrate is fully folded.

12. The method of Claim 1, wherein said substrate is folded such that said first active region and said second active region are folded inward such that said first active region and said second active region are not exposed when said substrate is fully folded.

13. The method of Claim 12, where said first active region comprises an extended portion having one or more conducting pads thereon, said extended portion remaining exposed when said substrate is fully folded.

14. The method of Claim 1, further comprising a third active region on said top side, said substrate folded such that said first active region remains exposed when said substrate is fully folded.